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CONCERNING

WILDFIRES AND CLIMATE CHANGE

Mr. Chairman and members of the Select Committee, thank you for inviting me today to discuss wildfires and climate change. I will focus my remarks on the interactions between wildfire and climate change, wildfire costs, research on wildfires and climate change, and the forest management practices we are employing to address these issues.

The Interactions of Wildfire and Climate Change

That the Earth's climate is changing means decisions being made today by policymakers and resource managers will have implications through the next century. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) shows that there have been clear patterns of temperature increase and long-term trends in precipitation change around the world since 1900. Results from over 20 different global models project strongly increasing temperatures for much of the globe, with the greatest increases generally projected for northern latitudes. The IPCC concluded that disturbances from pests, diseases, and fire are projected to have increasing impacts on forests, with longer fire seasons and large increases in area burned.

For North America the greatest increases in winter temperatures are projected in the boreal and arctic zones, with summer temperature increases the greatest across the lower 48 states in the United States. Precipitation is projected to decrease in the southwestern United States, and increase in some areas of the northeast. We can expect these temperature and precipitation patterns to lead to longer and more severe fire seasons in many areas of the United States and Canada, which underscores the need to continue to engage in active forest management as a mitigation measure.

While climate has always been variable, the suite of climate models evaluated by IPCC project an increased frequency and intensity of drought and high-intensity rainfall events, particularly in the boreal and temperate zones of the northern hemisphere. Historically, the extent and severity of drought, timing of spring snowmelt, and changes in ocean circulation patterns have all correlated with the extent and severity of forest and rangeland wildfires.

In some systems in North America (such as ponderosa pine and loblolly pine forests which historically had high frequency, low severity fires) reduced fire frequency beginning in the late 19th century has led to substantial fuel accumulation. These fuels increase fire hazard and burn severity, a condition that can be exacerbated by a warming climate and longer fire seasons (e.g., Westerling et al, 2006)[1]. Drought stresses trees and other vegetation, causing increased flammability of live and dead fuels and increased susceptibility to a number of insects (most notably bark beetles) and some pathogens.

Even with active restoration management at the landscape scale, large and severe forest and rangeland wildfires are more likely under dry conditions. However, fuels management can reduce fire intensity. Many areas of the United States have warmed over the past 40 years, with the greatest changes occurring in northern latitudes and in the western United States, where increases in temperature will result in earlier snowmelt and increased evaporation.

Wildfire Costs

Factors including changing temperatures, prolonged drought across many portions of the West and Southeast, and an expansion of the area and number of people living in the wildland-urban interface are expected to result in continued increases in acres burned, which will place additional pressure on fire suppression costs.

A recent study by the Department's Office of Inspector General found that the majority of the Forest Service's fire suppression costs were related to fighting fires in the wildland urban interface. According to our recently published report National Forests on the Edge, almost 22 million acres of rural private lands (about 8 percent of all private lands) located within 10 miles of the national forest boundaries are projected to undergo increases in housing density by 2030.

Climate Change Research

The Forest Service and the Department of the Interior provide long-term research, scientific information, and tools that can be used by managers and policymakers to address climate change impacts to forests and rangelands. Scientists from the Forest Service and the Department of the Interior also participate in the IPCC. The Forest Service has conducted over two decades of focused climate research, three decades of air pollution research, and has long experience in scientific assessments that provide a firm scientific foundation for addressing the challenges of forest and rangeland management relative to climate change.

The Forest Inventory and Analysis Program and more recent Forest Health Monitoring Program, for example, have tracked the status of and changes in vegetation on public and private lands for more than 75 years. The nationwide network of experimental forests

[1] Westerling. A.L., H. G. Hidalgo, D. R. Cayan, T. W. Swetnam. 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity. Science. 313(5789): 940 – 943.

and ranges provides up to 100 years of data on climate and hydrology. Further scientific support comes from partnerships with universities, federal and state agencies, non-governmental organizations, and the forest industry. Scientists and managers are using this information and working together to develop strategies for managing our changing forests and rangelands.

Forest Service Research and Development continues to study the interactions between fire and climate, factors affecting fire behavior and the potential effects of changing climate on fire patterns and vegetation. New research is addressing interactions between insect mortality and fire behavior. We are working to develop improved projections of the impacts of potential climate changes and methods to help us adapt to and mitigate those changes, including developing improved models to project the effects of climate change on future fire patterns in North America.

USDA agencies, including the Forest Service, are active in the United States Climate Change Science Program (CCSP). USDA is the lead for CCSP Synthesis and Assessment Product 4.3 on the effects of climate change on agriculture, land resources, water resources, and biodiversity, which is expected to be completed this December. A primary goal of the report is to enhance our understanding and ability to estimate impacts of future climate change on these systems and resources in the United States. This report is being prepared by the Department's Global Change Program Office with significant contributions from the Forest Service.

There are important knowledge gaps that need to be addressed. For example, current estimates of fire emissions vary widely. While we have information for a few systems, we do not have good information broadly on burn severity or on how burn severity will affect emissions or vegetation recovery. Current models of smoke dispersion need to be improved to more accurately predict the potential effects on human health. We also do not know how much we can increase carbon storage without causing unacceptable increases in fire hazard in fire-dominated ecosystems. Gaps in information about the timing, scale, and location of climate change impacts also exist. Climate models lack the ability to provide projections at the detailed scale that is most useful to land managers and local and regional planners.

Our scientists are looking for better ways of forecasting how ecosystems will change in response to a changing climate and how the changes will affect animals and plants that depend on these ecosystems. In partnership with other land managers, we will work to identify the landscape-level forest conditions most likely to sustain forest ecosystems in a changing climate.

Forest Management Practices

Each year, we manage the vegetation on millions of acres of National Forest System land to make forests more resistant to wildland fires, insects, and disease and more resilient to major disturbances such as a large wildfire. These same treatments can make our forests better able to withstand the stresses associated with climate change.

Our options include protecting the existing carbon sink through forest conservation and increasing carbon sequestration through reforesting degraded land, improving forest health, and supporting sustainable forest management. Many years of applying scientifically credible silvicultural techniques has proven the ability to increase forest growth and thus the storage of carbon. The use of forest biofuels for energy and the substitution of wood for manufactured products are other opportunities for managing carbon.

In many parts of the United States, forest health has decreased due to stress factors such as drought and increased stand densities. Active management of forests, as encouraged under the Healthy Forests Initiative and Healthy Forests Restoration Act, can help reduce the impact of wildfires on climate change and mitigate the impacts of climate change on our nation's forest and grasslands. The size and intensity of wildfires can be limited by reducing stand density and treating fuel buildup.

From 2001 through 2007, Federal land management agencies have treated approximately 25 million acres for fuels reduction on federal lands, including 18 million acres treated through hazardous fuels reduction programs and over 7 million acres of landscape restoration accomplished through other land management activities. Many of these projects have significantly reduced the impact of subsequent wildfires. Through the use of wildfire threat mapping and decision support tools, funding to address fire suppression and fuels reduction is being directed to areas where it can be most effective at reducing wildfire threats to communities and natural resources.

There is good scientific basis for vegetation treatments in appropriate fire regimes to reduce wildfire severity; treatments will reduce stress and crowding of vegetation and increase resistance to severe drought and to bark insects. Because climate in many areas will change more rapidly than long-lived plant species can migrate, planting a mix of species that may be better adapted to current and future climates may be appropriate following moderate to severe fires.

We are also finding ways to use the smaller diameter woody biomass in wood products that can store carbon. Forest biomass from fuel reduction projects can be used for bioenergy and wood products – this will decrease the net effective emissions from wildfires, offset fossil fuel emissions, and help to increase carbon storage. Scientists are evaluating options for incorporation of organic matter from forest fuels into the soil, where it may decompose slowly, and not add to fire hazard as much as if left on the surface. While wildfire is a part of the problem of climate change and carbon storage, collaborative management of fire and fuels and thoughtful restoration of burned areas can be a part of the solution.

Conclusion

In the future, we expect that changing climate will lead to shifts in vegetation and species distribution and disturbance patterns, none of which respect administrative boundaries. While we still have much to learn about the interactions among climate change, carbon emissions, and wildfire, there are science-based adaptive management approaches we are

taking today that can help reduce the impact of wildfires on climate change and mitigate the impacts of climate change on our nation's forest and grasslands. We are working with our partners to adapt our fire management practices and forest and rangeland management programs to anticipate the effects of climate changes and mitigate the potential impacts.

We are focusing on improving forest health and resilience of ecosystems to climate change by managing forests to reduce fuels and achieve healthy conditions. Federal, state and local managers are working together to increase community preparedness and to reduce fuel hazard and the likelihood of uncharacteristically severe fires and insect infestations. Many of the approaches we are using to reduce fire risk and restore fire-affected systems may also increase the resilience of America's forests to changing climate. Through active management, we are trying to increase the health, resiliency and productivity of fire-affected ecosystems across the United States.

Thank you for the opportunity to discuss these issues with the Committee. I would be happy to answer any questions that you have.